



Agrostis semibarbata: an old name for *Lachnagrostis punicea* (Poaceae)

Austin J. Brown

National Herbarium of Victoria, Birdwood Avenue, Melbourne, Victoria 3004, Australia;
e-mail: austinjamesbrown@gmail.com

Introduction

Brown and Walsh (2000) published the names *Agrostis punicea* A.J.Br. & N.G.Walsh var. *punicea* nom. et stat. nov. and *A. punicea* var. *filifolia* (Vickery) A.J.Br. & N.G.Walsh comb. nov. for *A. aemula* var. *setifolia* (Hook.f.) Vickery (syn. *A. billardierei* var. *setifolia* Hook.f.) and *A. billardierei* var. *filifolia* Vickery, respectively. Jacobs (2002, 2004) transferred these taxa to *Lachnagrostis* Trin. as *L. punicea* (A.J.Br. & N.G.Walsh) S.W.L.Jacobs subsp. *punicea* and *L. punicea* subsp. *filifolia* (Vickery) S.W.L.Jacobs, respectively. In preparing taxonomic papers on *Lachnagrostis*, some historic anomalies were uncovered in relation to *L. punicea* and *Agrostis semibarbata* Trin. These anomalies are corrected here, while the statuses of the associated subspecies are reassessed.

Materials and Methods

Type specimens (LE images and K loans) and original descriptions of *Agrostis semibarbata*, *A. billardierei* var. *setifolia* and *A. aemula* var. *setifolia* were assessed. Specimens at MEL (herbarium codes follow Thiers 2019+) of both subspecies of *Lachnagrostis punicea*, collected from South Australia and Tasmania, and specimens collected from Victoria in the last two decades were assessed for their spikelet, lemma body, lemma setae, lemma awn, palea body, palea setae and anther lengths, using the same technique as that reported by Brown and Walsh (2000). The current measurement set (from approximately 50 populations) was added to

Abstract

Agrostis semibarbata Trin. is found to be synonymous with *Lachnagrostis punicea* subsp. *punicea* (A.J.Br. & N.G.Walsh) S.W.L.Jacobs rather than with *L. aemula* (R.Br.) Trin., and the new combination, *L. semibarbata* (Trin.) A.J.Br. is made. As a result of morphological re-examination, *L. punicea* subsp. *filifolia* (Vickery) S.W.L.Jacobs is reduced to varietal status in the new combination *L. semibarbata* var. *filifolia* (Vickery) A.J.Br.

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those previously reported by Brown and Walsh (2000) for Victorian collections up to 1999, and a reappraisal of the character differences between the subspecies was made. For the pre-2000 Victorian specimens (40 of subsp. *punicea* from 18 sites and 52 of subsp. *filifolia* from 17 sites), means of duplicates were calculated before ranges and standard deviations were determined for the whole data set. Significant differences were assessed by calculating and comparing the twice standard errors (i.e., 95% confidence limits) for each mean.

Results and Discussion

Identifying *Agrostis semibarbata* Trin.

Trinius (1841) described a new species, *Agrostis semibarbata*, based on material from Tasmania. In July 1939, C.E. Hubbard marked two of four specimens of *Gunn 592/1* (Penquite, Tasmania, 9.xii.1844; K000838253–K000838254) with the note “These specimens agree well with the type of *Agrostis semibarbata* Trin. (Hb. Leningrad)”, and one of six specimens of *Gunn 1446* (New Norfolk, Tasmania, 15.xi.1840, K000838251–K000838252) with “This specimen agrees well with the type of *Agrostis semibarbata* Trin.” As part of the 1994 Smithsonian Institution and Komarov Botanical Institute Gramineae Types Project, Soreng *et al.* (1996) referred to a sheet at LE as the ‘holotype’ (“HT”) of *A. semibarbata* as “Trin. 1655.01: HT-frag. & fig.” Consequently, Tropicos (2017) currently reports the ‘holotype’ of *A. semibarbata* as “V. D. L. G (LE–TRIN–1655.01 (fragm. & fig.))” (originally as “V. D. L. C.”), the protologue “Island Van Diemen Australia”, and collector as “Hooker”.² Hubbard annotated the LE sheet with “= *Agrostis aemula* R.Br. var. *setifolia* (Hook.f.) Vickery m.s. 7/1939”. Vickery annotated the Penquite and New Norfolk collections at K (K000838253–K000838254 and K000838251–K000838252) as “*Agrostis aemula* var. *setifolia* (Hook.f.)” on 12th August 1938, a year before

Hubbard’s matching of them to *A. semibarbata*. Earlier annotations of unknown authorship on both collections include “*D. Billardieri* b”, “*Deyeuxia billardieri* Kunth.” and “var. *setifolia*” Hook.f.”

Hooker (1860), in his *Flora Tasmaniae*, briefly described *Agrostis billardieri* var. *β setifolia* Hook.f. on account of its “*foliis anguste setaceis*” [i.e., narrow bristly leaves] and “*arista prope basin paleae inserta*” [i.e., lemma awn inserted near the base], but did not cite any specimens. He cited *Gunn 592* and *Gunn 1007* under *A. billardieri*, and *Gunn 592 p.p.*, *Gunn 1006* and *Gunn 1447* for *A. aemula*, but does not mention *Gunn 1446* at all. Apart from the *Gunn 592/1* Penquite collection, there are three other collections labelled as *Gunn 592* at K: ‘New Norfolk’, 11.xii.1840 (K000607848), ‘Macquarie Plains’, 19.xi.1842 (K000342384) and ‘side of the Western Mountains’, 16.i.1845 (K000607846–K000607847). The taxon annotation on two of these sheets (K000607848, K000607846–K000607847) is “*Deyeuxia forsteri* Kunth”, which is the same as on the K material Hooker (1860) likely used to describe *A. aemula*, namely: *Gunn 1006*, Tasmania, 11.xii.1837 (K000607849); *Gunn 1447*, base of Mt Wellington, 1.iii.1839 (K000607839); *Gunn 1447*, New Norfolk, xii.1839 (K000607838); *Gunn 1447*, New Norfolk xi.1840 (K000607845) and *Gunn 1447*, South Esk, Launceston, 17.xii.1844 (K000607844). The older name of *Deyeuxia forsteri* (Roem. & Schult.) Kunth. *nom. illeg.* was used by Hooker (1853) in his *Flora Novae-Zelandiae*, under which he placed *Agrostis forsteri* Roem. & Schult. *nom. illeg.*, *nom. superfl.*, *A. aemula* R.Br., *A. retrofracta* (as “*Schrad. in Herb. Hook.*”)³, and *Avena filiformis* G.Forst. and *Lachnagrostis filiformis* (G.Forst.) Trin. as synonyms. As *Gunn 1007* (K000342399), with its broad leaves, is a typical example of *A. billardieri* R.Br. var. *billardieri* (syn. *L. billardieri* (R.Br.) Trin. subsp. *billardieri*), Hooker may have had *Gunn 592/1* (Penquite) in mind as his representation of *A. billardieri* var. *setifolia*.

Hooker (1860) described *Agrostis billardieri* var. *billardieri* as having “Lower palea [i.e. lemma] silky at the base [...] awn inserted at the middle of the palea”, whereas *A. aemula* is described as “Lower palea very silky all over [...] awn inserted at the middle.” It is not certain whether he was referring to the callus with his “lower palea silky at the base” or to the lower back

1 Current examination of an image of the type sheet for *Agrostis semibarbata* has concluded that “V.D.L.C.” is a misinterpretation of the handwriting “V.D.L.6” (i.e. Van Diemen’s Land No. 6) on the specimen label.

2 Hooker’s name does not appear on the lectotype sheet but derives from Trinius’ publication of the taxon (Trinius 1841). This does not mean that Hooker collected the specimen himself but most likely that it was collected for him and subsequently forwarded to Europe. William Hooker never visited Australia and although his son Joseph collected in Tasmania, this was not until August 1840. It is therefore very unlikely, even if Joseph Hooker had made a collection of *A. semibarbata*, that it would have reached Trinius in time for his publication.

3 Brown (2019) notes that “*Schrad. in Herb. Hook.*” refers to a collection by Schrader, not an author citation for the name.

of the lemma. Brown (1810), when first describing *A. billardierei*, noted "*valvula exteriore perianthii* [i.e. lemma] *glabra*" as opposed to "*pubescent*" as given for *A. aemula*, and it could be assumed that Hooker would have followed his lead. Based on this assumption, and given that Hooker (1860) does not mention the hairiness of the lemma when describing *A. billardierei* var. *setifolia*, the reader would assume that his new variety also had a glabrous lemma, apart from the callus. However, examination of both *Gunn 592/1* (Penquite) and *Gunn 1446* (New Norfolk) shows that all specimens on these sheets, except for one (top left of 1446)⁴, have hairy lemmas and conform to *Lachnagrostis punicea* subsp. *punicea* (syn. *A. aemula* var. *setifolia*). This being the case, Hooker's "lower palea silky at the base" seems to refer to the lower part of the lemma after all. Regardless of the character of the lemma indumentum, Hooker probably assigned var. *setifolia* to *A. billardierei* on the basis of its larger spikelets, as compared to *A. aemula*. In reference to *A. billardierei*, Hooker notes "Spikelets larger than in the allied species, 1/4–1/3 inch [i.e. 6.4–8.4 mm] long." Hooker's "allied species" were *A. aemula* R.Br. and *A. montana* R.Br. *nom. illeg. non* Krockner (syn. *Deyeuxia monticola* (Roem. & Schult.) Vickery), which were regarded by him as conspecific. For *A. aemula*, Hooker (1860) notes "Spikelets 1/8–1/6 inch [i.e. 3.2–4.3 mm] long." Spikelet lengths for *L. punicea* range from 4.5–7.0 mm (Brown and Walsh 2000) and are therefore more akin to Hooker's spikelet sizes for *L. billardierei* than for *L. aemula*. However, despite Trinius (1841) describing the spikelets of *A. semibarbata* as "*Spiculis 3 – linealibus*" [i.e. 3 lines = 6.33 mm length], Hooker (1860) regarded Trinius' taxon as synonymous with *A. aemula* (albeit with a question mark), rather than with *A. billardierei*.

In formally describing *Agrostis aemula* var. *setifolia*, Vickery (1941) designated *Gunn 1446* (K) as the 'Type' and cited *Gunn 592* (Penquite)⁵ as an additional specimen under her concept of the taxon. Like Hooker, she included the other *Gunn 592* collections at K as examples

of *A. aemula* var. *aemula* but assigned *Gunn 1447* (base of Mt Wellington) and *Gunn 1006* to *A. avenacea* Gmel. (syn. *Lachnagrostis filiformis* (G.Forst) Trin.). Hooker's concept of *A. aemula* (or *Deyeuxia forsteri*) was that it also included the taxon currently known as *L. filiformis*. Also, like Hooker, Vickery (1941) referred *A. semibarbata* to *A. aemula* R.Br. var. *aemula*. Even though she noted of *A. semibarbata*, "from the description this appears to represent a form with large spikelets, lemma with 2 long teeth, and anthers large and linear", she seemingly overlooked its striking resemblance to her *A. aemula* var. *setifolia*, including its "*Foliis compressis*" [i.e. compressed leaves], "*Valvula inferior [...] inferne circiter tertiam partem pilosa*" [i.e. Lemma pilose below about third part] and the "*Arista infra medium valvulae proveniens*" [i.e. Awn below middle of lemma] descriptions by Trinius (1841).

Although a physical assessment of LE TRIN-1655.01 could not be made due to restrictions on loans, an image of the sheet (Figure 1) and high-resolution images of a few open spikelets were made available by LE for examination. These images show the narrow leaves, long pedicels and large spikelets diagnostic for *Lachnagrostis punicea*. A sketch of the spikelet and floret, probably by Trinius, is attached to the sheet and allows an assessment of character sizes to be made. The upper glume is noted as "*3 lin. longa*" and therefore corresponds to the Trinius (1841) description. The upper glume is calculated to be 7.6 mm long, if taken as the Russian 'liniya' (r: 1 line = 2.54 mm), or as 6.3 mm if taken as the standard botanical (or English) line (b: 1 line = 2.12 mm). The remainder of the sketch can be proportioned accordingly and provides lengths of 8.5 (r) or 7.0 (b) mm for the lower glume, 5.7 (r) or 4.8 (b) mm for the total lemma, 2.0 (r) or 1.7 (b) mm for the lemma setae and 3.6 (r) or 3.0 (b) mm for the total palea. Brown and Walsh (2000) describe the lower glume length as 4.5–7 mm, the total lemma length as 3–5.5 mm, the lemma setae as 0.5–1.5 mm and the total palea length as 2.5–4.5 mm. This comparison suggests that Trinius used the standard botanical line, rather than the Russian line, for his measurements. In addition to the sketch of the spikelet, separate sketches were made of the floret, lemma back, lemma apex, palea, rachilla extension, lodicules, ovary and anther (Figure 1). It is difficult to be certain of the scales at which some of these flower parts were drawn, but comparisons between features

⁴ The odd specimen out is *L. punicea* subsp. *filifolia* (Vickery) S.W.L.Jacobs (syn. *Agrostis billardierei* var. *filifolia* Vickery): a more mature specimen than its companions with minutely scabrid, but distinctly hairless, lemmas.

⁵ Both Hooker (1860) and Vickery (1941), when citing the Penquite collection, only refer to it as *Gunn 592*, whereas the collection label states *Gunn 592/1*. This is likely to be a modification made by Hooker to Gunn's original collection number, in recognition of its morphological distinction from other Gunn collections bearing the same number.

common among the sketches suggest that, if using the standard botanical line, anther length is either 1.4 mm or 2.0 mm (depending on the scale) and palea setae points are 0.6 mm (i.e., 20% of total palea length) and within the Brown and Walsh (2000) reported ranges of 0.8–2.1 and 0.3–1.2 mm, respectively. However, the lemma awn attachment is higher, at 26–28% from the base, than is typical (10–20%). The high-resolution spikelet images (not shown) indicate the total lemma length to be approx. 5.8 mm long, attachment of the lemma awn at approx. 10% of the lemma length from its base, setae points at the apices of the lemma and palea to be approx. 2.4 mm and 0.6–1.0 mm, respectively, and anthers to be approx. 1.9 mm long. All of these observations and calculations are indicative of the specimen being *L. punicea*.

With the confirmation that Hubbard was correct in determining *Gunn 592/1* and *Gunn 1446* to be the same taxon as LE TRIN–1655.01 it is clear that, along with Hooker (1860) and Vickery (1941), all treatments of *Agrostis* or *Lachnagrostis* since (Ross 1989, Morris 1994, Jacobs 2001, Quottrocchi 2006, Jacobs and Brown 2009, CHAH 2015, Tropicos 2017) have incorrectly treated *A. semibarbata* Trin. as a synonym of *A. aemula* R.Br. or *L. aemula* (R.Br.) Trin. Instead, not only should *A. semibarbata* be regarded as a synonym of *L. punicea*, the latter is also the correct specific epithet for the taxon.

Identifying the original collection

The exact provenance of LE TRIN–1655.01 is unknown. The hand-written label states “V.D.L.6” [Van Diemen’s Land No.6], with no collecting date, specific collection location or collector’s name. Hooker’s name does not appear on the sheet, only in Trinius (1841). As the specimen consists of only one emerging panicle, its flag leaf and a length of culm with a second leaf (Figure 1), it appears to have been removed from a larger collection. The “V.D.L.6” on the LE specimen sheet appears to be a collection number applied to a duplicate taken from the herbarium of Joseph Dalton Hooker’s (1817–1911) father, William Jackson Hooker (1785–1865). Two sheets of *Lachnagrostis semibarbata* at K are marked with either “V.D.L.10” (K000913405–K000913406) or “V.D.L.12” (K000838424), and a further sheet at LE is marked “V.D.L.7 Hooker” (LE TRIN–1584.06), suggesting that a series of duplicates were prepared by Hooker for Trinius.

William Hooker, future Director of Kew Gardens, but then at Glasgow University, was an active recipient of Tasmanian plant specimens during this period, utilising colonial collectors, such as Thomas Scott (1800–1855), Robert Lawrence (1807–1833) and Ronald Campbell Gunn (1808–1881). Scott forwarded some seed and a few plants to Hooker but no known grass collections. Lawrence was actively sending Hooker seeds from 1830 and dried plant specimens from 1831 (Burns and Skemp 1961) until his early death. Gunn was introduced to Hooker by Lawrence via letter and became his successor in supplying plant specimens to Great Britain from 1832–1849 and, as such, is the most likely collector of the material from which LE TRIN–1655.01 was taken. However, the K sheet marked “V.D.L.12” is a Lawrence collection, while the “V.D.L.10” sheet was collected by Gunn. A further contender for the original collection of *Agrostis semibarbata* is James Backhouse, a Quaker from England who visited Tasmania and New South Wales as a missionary to settlers and convicts during 1832–1838, but who consequently took an active interest in the flora. Although it is not known if Backhouse collected any grasses, some of his earlier plant collections from Tasmania were forwarded by Gunn to Hooker (Burns and Skemp 1961).

Trinius’ publication of *Agrostis semibarbata*, dated 5th February 1841, precedes the collection of *Gunn 592/1* by almost three years, and although publication coincides with the collection date of *Gunn 1446* on 15th November 1840, it is highly unlikely that this collection could have reached Hooker in Glasgow and been subsequently processed and forwarded to St Petersburg in time for its inclusion in Trinius’ study. Gunn’s earliest known collection of 592 dates from 1833 (Gunn c.1830–1850). Also, in an 1835 consignment to Hooker, sent as Box 2, at least one collection was labelled *Gunn 592* (Burns and Skemp 1961). The current whereabouts of both these collections are unknown but either could be the source of LE TRIN–1655.01. As *Lachnagrostis punicea* (syn. *A. semibarbata*) has been found growing with *L. aemula* (Brown and James 1998), the specimen at LE may have been part of a mixed gathering collected with *Gunn 592* and separated out by either Hooker or Trinius.

Infraspecific classification

Brown and Walsh (2000) recognised that *Agrostis aemula* var. *setifolia* Vickery and *A. billardiarei* var. *filifolia* Vickery were varieties of the same species viz. *A. punicea*. Jacobs subsequently (2001, 2002, 2004) placed 15 Australian species of *Agrostis* into *Lachnagrostis*, including *A. punicea*, but raised the varieties recognised by Brown and Walsh to subspecies. Brown and Walsh (2000) showed that, apart from its hairy lemmas, *A. aemula* var. *setifolia* only differed statistically from *A. billardiarei* var. *filifolia* in its slightly longer lemmas, lemma setae and awns. However, the range in these floret character lengths show considerable overlap. The addition of recent measurements of spikelet characters to the original Brown and Walsh (2000) data set, with recalculation of means and standard deviations, does not support the statistical differences that were previously observed, even though the spikelets, lemma setae and awns tend to be longer in subsp. *punicea* (Table 1). Therefore, only the difference in lemma hairiness between the two subspecies remains. Brown (2012) noted that as there are no intermediates between the villous lemmas of subsp. *punicea* and the glabrous lemmas of subsp. *filifolia*, it is probable that a single gene is responsible for the distinction. Both subspecies occur in similar ecological niches and have been found

in mixed populations (Tasmania: New Norfolk – type sheet at K; Victoria: Buckley Swamp; Lake Repose, South Bulart, Moyne Falls, Peshurst, Hexham; South Australia: East Avenue), though these represent only 8% of known sites for the species. As the numbers of pure populations of both subspecies are similar, it seems that neither has dominance and that their largely allopatric distribution is the result of stochastic genetic drift.

Hamilton and Reichard (1992) note that, in practice, there is little difference between subspecies and variety, with European botanists tending to favour the former and Americans favouring the latter. Both infraspecific levels usually require additional differentiation (e.g. geographic, ecological, phylogenetic) beyond morphological distinction, to warrant recognition. Earlier, Clausen (1941) argued that use of the term ‘variety’ in taxonomic treatments not only breaks with the Linnaean tradition of describing “mere trivial genetic variations”, but has become confused through its multifaceted and inconsistent use in horticulture.

Walsh (2015) has also noted the lack of precision in defining the difference between subspecies and variety but suggests that the rank of subspecies has more recently, at least in Australia, been reserved for entities within a species that display a more or less geographical or ecological separation, as opposed to variety for “weakly distinguishable entities with a greater

Table 1. Minimum, maximum and mean length (mm), standard deviation (SD) and twice standard error (2SE = 95% conf. limits) for spikelet characters across specimens of *Lachnagrostis punicea* subsp. *punicea* and *filifolia*, and significant differences in characters between them.

Taxon	Lower glume	Lemma body	Lemma setae	Lemma awn	Palea body	Palea setae	Anther
<i>Lachnagrostis punicea</i> subsp. <i>punicea</i> (42 collections)							
min	4.8	2.6	0.6	7.0	2.0	0.3	0.8
max	9.7	4.7	1.8	14.3	3.8	1.2	1.8
Mean	6.18	3.37	1.08	10.07	3.02	0.60	1.33
SD	0.93	0.48	0.29	1.33	0.40	0.18	0.23
2SE	0.28	0.14	0.09	0.40	0.12	0.05	0.07
<i>Lachnagrostis punicea</i> subsp. <i>filifolia</i> (35 collections)							
min	4.0	2.2	0.4	5.7	2.0	0.3	0.8
max	7.7	4.4	1.7	13.7	4.3	1.2	1.9
Mean	5.77	3.26	0.94	9.21	2.89	0.57	1.25
SD	0.83	0.46	0.38	1.60	0.49	0.18	0.24
2SE	0.28	0.15	0.13	0.53	0.16	0.06	0.08
sign. diff.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.

n.s. = no significant difference at 95% confidence limits

degree of sympatry.” Under these criteria, infraspecific classification for *Lachnagrostis punicea* would not support the use of subspecies. Within *Lachnagrostis*, Brown (2006, 2015a, 2015b) has utilised subspecies for morphologically distinct entities within *L. nesomytica* A.J.Br., *L. rudis* (Roem. & Schult.) Trin. and *L. adamsonii* (Vickery) S.W.L.Jacobs, but these, unlike *L. punicea*, also have distinct ecological niches or, at least, geographical separation.

Use of the term ‘forma’ in non-horticultural taxonomy dates from the mid 1840s and is usually employed to denote a minor genetic difference without extramorphological integrity. By this definition, it would seem more consistent to reduce the subspecies of *Lachnagrostis punicea* to formae. Amongst grasses, some precedent for this approach has been established in the *Flora of Australia*, where Weiller (2009) accepts *Vulpia megalura* (Nutt.) Rydb. as a form of *V. myuros* (L.) C.C.Gmel. as *V. myuros* f. *megalura* (Nutt.) Stace & R.Cotton, based solely on the conspicuous presence of marginal cilia on its upper lemmas. Another example is afforded by the acceptance of *Lolium arvense* With. as a form of *L. temulentum* L., *L. temulentum* f. *arvense* (With.) Junge, by Weiller *et al.* (2009), based on its lemma being unawned or having a short, weak, flexuose awn, versus a lemma with a distinct, long and straight awn in the typical form. In both these examples of naturalised species, geographic and ecological ranges are similar for the two forms, which are often found coexisting in the same population⁶.

Nevertheless, and despite the above argument, it seems most appropriate to avoid the forma level of classification for a number of reasons. Firstly, very few contemporary treatments employ formae. Within a world-wide survey of 8043 species (Hamilton and Reichard 1992), only 4.0% of the 1020 species that were subdivided use the rank of forma (i.e., 0.32% of species overall). An examination of accepted taxa recorded in the Australian Plant Census (CHAH 2015) shows only 57 taxa at forma level, accounting for less than 0.2%

of all currently accepted names (excluding autonyms). Formae were confined to 34 species in 26 genera. Of these, seven species are naturalised, 13 are rainforest shrubs or trees, three are vines and three are geographic forms awaiting more conventional names. Secondly, the use of forma may imply phenotypic difference in response to environmental factors, rather than a genetic cause. Hamilton and Reichard (1992) note that authors utilising formae usually did so in the traditional sense of denoting distinct phenotypes which have no significant persistent populations. Thirdly, Stuessy (1990) regarded formae as plants having unusual morphological features growing near plants with more typical features, with the implication that the unusual individuals are infrequent and of sporadic occurrence. This is not the case for *Lachnagrostis punicea*. Stuessy (1990) recommended that the rank of forma should only be used for cultivated plants, or in breeding programs where ‘forms’ of wild plants have the potential for commercialisation.

It is therefore most consistent to reduce the subspecies of *Lachnagrostis punicea* to varieties under *L. semibarbata*. This also has the effect of returning to the original infraspecific concept of Brown and Walsh (2000) for these taxa.

Currently, *Lachnagrostis punicea* subsp. *punicea* and *L. punicea* subsp. *filifolia* are both listed as rare in South Australia (National Parks and Wildlife Act 1972, Version 1.7.2015), Victoria (Department of Environment and Primary Industry Advisory List, 2014) and Tasmania (Department of Primary Industries, Parks, Water and Environment Threatened Species Protection Act 1995). Both taxa are also listed as threatened under the Victorian Flora and Fauna Guarantee (FFG) Act 1988 but neither are listed under the National Environment Protection and Biodiversity Conservation (EPBC) Act 1999. As Walsh (2015) has pointed out, varieties are not eligible to be listed under section 178 of the EPBC Act, whereas subspecies are. Nevertheless, reducing subspecies status to varietal status in accordance with the biological arguments presented above, does not diminish the importance of protecting both taxa from a conservation point of view. As these varieties are not commonly found in sympatry, there remains a real potential for speciation events to occur over time.

⁶ In the examples of formae provided by *Vulpia myuros* and *Lolium temulentum*, infraspecific naming in both species has a varied history, with *V. myuros* f. *megalura* (Nutt.) Stace & R.Cotton (1976) also treated at varietal or subspecific rank as *V. myuros* var. *megalura* (Nutt.) Auquier (1977) and *V. myuros* subsp. *megalura* (Nutt.) Soják (1979), and *L. temulentum* var. *arvense* (With.) Lilj. (1816) also treated at formae and subspecific rank as *L. temulentum* f. *arvense* (With.) Junge (1913) and *L. temulentum* subsp. *arvense* (With.) Tzvelev (1971).

Taxonomy

Lachnagrostis semibarbata (Trin.) A.J.Br. comb. nov.

Agrostis semibarbata Trin., *Agrostidea*, II, Callo Rotunda, (Agrostea), 132 (1841).

Type: *s. loc.*, *s. dat.*, *leg. ign.* V.D.L.6 (lecto, here designated as holotype: LE TRIN-1655.01 (fragm. & Figure)).

Agrostis billardierei var. *setifolia* Hook.f., *Fl. Tasman.*, 3(2): 115 (1860); *Agrostis aemula* var. *setifolia* (Hook.f.) Vickery, *Contr. New South Wales Natl. Herb.* 1: 116 (1941); *Agrostis punicea* A.J.Br. & N.G.Walsh var. *punicea*, *Muelleria*, 14: 84–85 (2000); *Lachnagrostis punicea* (A.J.Br. & N.G.Walsh) S.W.L.Jacobs subsp. *punicea*, *Telopea*, 9(4): 837 (2001).

Type: TASMANIA. New Norfolk, 15.xi.1840, M. Ballantine for R.C. Gunn 1446 (lecto: designated by J.W.Vickery, *Contr. New South Wales Natl. Herb.* 1: 116 (1941)), K000838251! and K000838252!, a single gathering mounted as one preparation with two accession numbers; isolecto: HO35753!).

Notes: Soreng *et al.* (1996) referred to a sheet at LE as the 'holotype' of *A. semibarbata*. However, as this work (*Catalogue of the C. B. Trinius Herbarium (LE)*, 2nd edn) is not effectively published under ICN Articles 29 and 30 (Shenzhen Code, 2018; R. Soreng, pers. comm. 2019), this does not constitute effective lectotypification by Soreng *et al.* in accordance with ICN Art. 7.11 (Shenzhen Code, 2018), and the name is lectotypified here.

Vickery (1941) cites the type of the name *Agrostis billardierei* var. *setifolia* Hook.f. as 'Tasmania: New Norfolk, Gunn, No. 1446, 15.11.1849 (Type, K.)'. Jacobs and Brown (2009) noted that *Gunn 1446* was collected by Ballantine, which is the name on the isotype at HO in accordance with the initials 'MB' on the original Gunn label.

Hooker (1860) did not specify a type for *Agrostis billardierei* var. *setifolia* Hook.f., but cited both *Gunn 592* and *Gunn 1007* under his concept of *A. billardierei*. Vickery, in using *A. billardierei* var. *setifolia* Hook.f. as the basionym for *A. aemula* var. *setifolia* (Hook.f.) Vickery, cited *Gunn 1446* (New Norfolk) as the type, even though Hooker (1860) made no reference to *Gunn 1446* in the protologue. However, as both sheets at K bear the inscription 'b' as a probable identification by Hooker to Hooker's (1860) "*Agrostis billardierei* var. *β setifolia*", both

specimens can be considered original material under Article 9.4a (Shenzhen Code 2018).

Lachnagrostis semibarbata var. *filifolia* (Vickery) A.J.Br. comb. et. stat. nov.

Agrostis billardierei var. *filifolia* Vickery *Contr. New South Wales Natl. Herb.* 1, 110 (1941). *Agrostis punicea* var. *filifolia* (Vickery) A.J.Br. & N.G.Walsh *Muelleria*, 14, 85–86 (2000). *Lachnagrostis punicea* subsp. *filifolia* (Vickery) S.W.L.Jacobs *Telopea* 10(4), 840 (2004).

Type citation: "Hawkesdale, H. B. Williamson, No. K. 410, 12.1901 (Type K., S.)."

Type: VICTORIA. Hawkesdale, xii.1901, H.B. Williamson K.410 (lecto: designated by A.J.Brown & N.G.Walsh, *Muelleria* 14: 85 (2000): K000838266!; isolecto: NSW504501!).

Notes: Vickery (1941) cites *Williamson K410* as the type of the name *Agrostis billardierei* var. *filifolia* Vickery, and lists syntype material at K and S. Brown & Walsh (2000) cite the type of the name *Agrostis billardierei* var. *filifolia* Vickery as "Victoria, Hawkesdale, Dec. 1901, *Williamson* (holotype K)", and this is here treated as effective lectotypification by Brown and Walsh in accordance with ICN Art. 7.11 (Shenzhen Code, 2018). As Brown and Walsh's citation meets the relevant requirements of ICN Art. 7.11, their use of the term 'holotype' is correctable under ICN Art. 9.10. Additional material in S, cited by Vickery, has not been seen by the present author. A further specimen, MEL2022935A (Hawkesdale, Victoria, xi.1903, H.B. *Williamson s.n.*) was probably collected from the type locality, two years later. The sheet also contains MEL2022935B—inflorescence fragments of *Lachnagrostis billardierei* Trin. subsp. *billardierei*.

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Figure 1. Holotype of *Agrostis semibarbata* Trin. (LE-TRIN-1655.01). Image kindly provided by the Komorov Botanical Institute, Saint Petersburg.

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